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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/330,225	06/10/1999	GLENN E. LEE	CISCP086	9145

22434 7590 03/12/2003

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EXAMINER

SRIVASTAVA, VIVEK

ART UNIT	PAPER NUMBER
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2611

DATE MAILED: 03/12/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/330,225

Applicant(s)

LEE ET AL.

Examiner

Vivek Srivastava

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 16 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant argues that Otani fails to teach or suggest a method or apparatus for transmitting or configuring multiple upstream channels in a cable modem based on upstream channels assigned in the downstream channel, in the manner claimed in claims 1, 11, 20, 35, 36 and 37.

The Examiner concurs. However, it would have been obvious to modify Otani to include this limitation. Please see rejection below.

Applicant also argues that Otani fails to teach or suggest a head end that assigns a first and a second upstream channel to a cable modem, in the manner claimed in claim 19. The secondary reference also fail to teach or suggest such limitations.

The Examiner concurs. However, it would have been obvious to modify Otani to include this limitation. Please see rejection below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11, 19-26, 28-29, 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani, U.S. Patent 6,351,469.

Regarding claims 1, 20, 36, Otani discloses an apparatus, method, and software for delivery of voice and data traffic over a cable network using a single MAC and multiple logical upstream channels multiplexed onto a single transmitter (tuner), wherein: transmitting a first portion of the upstream data on a first upstream channel from the cable modem; and transmitting a second portion of the upstream data on a second upstream channel from the cable modem, the second upstream channel differing from the first upstream channel is shown in Figure 7, and described in column 15, lines 41-51. As claimed "upstream data" reads on all data sent upstream by the cable unit, ie, both voice and data, as disclosed in column 15 lines 48-51. The limitation of a "first portion" and a "second portion" of all upstream data reads on voice on the B-channel and data on the C-channel. Claim 1 is broad enough to read on the "upstream data" with an entire upstream transmission spectrum of which voice and data are "portions" thereof.

Otani fails to disclose assigning a first upstream channel and a second upstream channel in a downstream channel received into the cable modem.

It would have been well known to assign upstream channels in a downstream channel (see Limb et al, col 2 lines 18-35) and it would have been obvious transmitting upstream channel allocation information in a downstream channel from a headend or server would have provided information as to which return channel a receiver station would use and would have obviated the need for the receiver to determine which channel is available for upstream transmission. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include assigning a first upstream channel and a

second upstream channel in a downstream channel to obviate the need for the receiver having to determine available channels for upstream communication.

Regarding claims 2, 37, Otani discloses an apparatus, method, and software, as claimed, wherein obtaining the first and the second upstream channel from information in the downstream channel input to the cable modem is shown in Figure 9, and described in column 16, lines 8-10. The downstream information used in the selection of the first and second upstream channels is the busy/idle status of each channel, and the arrangement for sharing vs dedicated channel(s). Regarding the claimed "receiving a downstream signal within a downstream channel into the cable modem, wherein the downstream signal specifies an assignment of a first upstream channel and a second upstream channel", see claim 1 above.

Regarding claims 3, 4, Otani discloses an apparatus, method, and software, as claimed, wherein obtaining the upstream channel descriptor (UCD) is shown in Figure 9, and described in column 16, lines 1-13; and obtaining the first upstream channel comprises selecting the first one of the collected UCD; and the second upstream channel comprises selecting the second one of the collected UCD is described in column 6, lines 39-47, wherein, in the case of reservation traffic, channel assignment is selected sequentially bottom up, or, in the case of collision traffic, channel assignment is selected sequentially top down. Here, a UCD is the busy/idle status of a channel and whether or not the channel is dedicated or shared.

Regarding claims 5, 6, Otani discloses an apparatus, method, and software, as claimed, wherein selecting the first and second UCD is based on a random algorithm is shown in Figure 15, (1508, 1510), and described in column 21, lines 18-33. Due to random call arrival and departure at other stations sharing the same upstream bandwidth, the UCD (or channel) selected for assignment, after the last busy/idle status check, is no longer predictable.

Regarding claims 7, 23, Otani discloses an apparatus, method, and software, as claimed, wherein transmitting data over the first upstream channel is alternated with transmitting data over the second upstream channel, as described in column 22, lines 37-48. This is an embodiment of upstream transmission of data from the same station over multiple channels, wherein data frames are assigned non-overlapping sequence numbers, transmitted over multiple channels, and reassembled at the other end.

Regarding claims 8, 24, Otani discloses an apparatus, method, and software, as claimed, wherein "a first type of data", as described in column 5, lines 38-43, wherein the "first medium" is voice, and "second medium" is data.

Regarding claims 9, 25, Otani discloses an apparatus, method, and software, as claimed, wherein data are transmitted over the first upstream channel when it is less congested than the second channel, and data are transmitted over the second channel when it is less congested than the first channel is described in column 6, lines 39-47. For reservation traffic, congestion on a channel occurs when the channel is busy (ie, being reserved for a call or carrying a stable call - either voice or data), then a next available B-channel is selected for assignment.

Regarding claims 10, 26, Otani discloses an apparatus, method and software, as claimed, wherein data are primarily transmitted over the first upstream channel, and data are transmitted over the second channel to facilitate load balancing is described in column 6, lines 39-47. For reservation, traffic, a next call is assigned to a next available B-channel.

Regarding claim 11, Otani discloses an apparatus, method, and software, as claimed, wherein: a processor configured to initiate transmission on multiple upstream channels; and an upstream transmitting component operating in conjunction with the processor and configurable by the processor to transmit data over multiple upstream channels, as shown in Figure 5 (507,

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504), and described in column 14, lines 62-67, wherein the processor is the channel manager unit 507 and the upstream transmitting component is the frame assembling unit. Otani fails to disclose wherein the multiple upstream channels are assigned within a downstream channel received into the cable modem, see claim 1 for obviousness.

Regarding claim 19, Otani discloses an apparatus, method, and software, as claimed, wherein a headend splitter is shown in Figure 4 (404), and described in column 13, lines 55-61. Otani fails to disclose wherein the headend is further operable to assign the first upstream channel and the second upstream channel to the cable modem, see claim 1.

Regarding claims 21, 22, Otani discloses an apparatus, method, and software as claimed, wherein determining whether the cable modem is authorized to transmit over multiple upstream channels prior to configuring the cable modem to transmit over the second upstream channel, and configuring the cable modem with the second upstream channel only where the cable modem is authorized to transmit over multiple channel is described in column 10, lines 11-15, and column 35, lines 51-58. Authorization for sending data is provided using filter on MAC address.

Regarding claims 28-29, Otani discloses, in the fourth and fifth embodiments, that a dedicated C-channel (a dedicated connection for data services) can be created between a CAU and the headend by a craft person through a maintenance console, as described in column 25, lines 1-4. Voice call is then assigned dynamically to one of the remaining B-channels based on their busy/idle status.

Claims 12, 14, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani, in view of Eng U.S. Patent 5,963,557.

Regarding claim 12, Otani discloses an apparatus, method, and software, as claimed, wherein a single transmitter is used to transmit multiple logical upstream channels, as shown in Figure 5 (504, 503), and described in column 14, lines 62-67.

Otani does not disclose the use of a second transmitter.

Eng discloses the use of two transmitters (tuners) to separately transmit reservation and collision traffic to improve their throughput performance, as shown in Figure 10A, and described in column 11, lines 32-46.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include transmitting reservation and collision traffic, separately using two transmitters, as disclosed by Eng, to enable the use of scheduling algorithms that are optimum for each types of traffic to improve throughput performance and signal quality, and as a consequence, more effective use of upstream capacity.

Regarding claim 14, Otani does not disclose a combiner, as claimed.

Eng discloses a combiner, as shown in Figure 10A (180), and described in column 12 lines 66-67, and column 13, lines 1-6.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include a combiner, as disclosed by Eng, to enable simultaneous transmission of both types of traffic over a single coaxial line.

Regarding claim 18, Otani does not disclose a MAC is arranged to output data to the first and/or second transmitter, as claimed.

Eng discloses an apparatus, method, and software, as claimed, wherein a MAC is arranged to output data to the first and/or the second transmitter (ie, tuner 178 and tuner 184), as shown in Figure 10A (162), and described in column 12, lines 29-54.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include a MAC is arranged to output dataa to the first and/or the second transmitter, as disclosed by Eng, to enable simultaneous transmission of both types of traffic using two transmitters (tuners).

Claims 13, 15-17, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani, in view of Eng, and further in view of Friedman U.S. Patent 5,949,788.

Regarding claims 13, 15, 35, Otani discloses a cable unit (CAU) with a processor, a single MAC, multiple logical channels, and a single transmitter (tuner) for transmitting voice (reservation) traffic and data (reservation or non-reservation) traffic over a cable network.

Eng discloses that by transmitting reservation traffic separately from non-reservation traffic using two transmitters (tuners), cable operators can make effective use of the upstream capacity by improving the throughput performance and signal quality of the reservation and collision traffic.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani, in view of Eng, to also include multipoint trunking, as disclosed by Friedman, to enable cable operators to expand the transmission capacity to support individual types of traffic independently from each other, and as a consequence, minimizing expansion costs.

Further, Otani fails to disclose the claimed "receive a downstream signal within a downstream channel into the cable modem, wherein the downstream signal specifies an assignment of a first upstream channel and second upstream channel.

It would have been well known to assign upstream channels in a downstream channel (see Limb et al, col 2 lines 18-35) and it would have been obvious transmitting upstream channel allocation information in a downstream channel from a headend or server would have provided information as to which return channel a receiver station would use and would have obviated the need for the receiver to determine which channel is available for upstream transmission. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include assigning a first upstream channel and a second upstream channel in a downstream channel to obviate the need for the receiver having to determine available channels for upstream communication.

Regarding claim 16, Otani discloses a separate memory portion for voice and data, as shown in Figure 5 (504, 508), and described in column 14, lines 62-67.

Otani, in view of Eng, and further in view of Friedman, discloses "the first MAC", as described in the response to claims 12-13, and 15.

Regarding claim 17, Otani discloses a separate memory portion for voice and data, as shown in Figure 5 (504, 508), and described in column 14, lines 62-67.

Otani does not disclose the first and second packet memory is located within a DRAM device.

Official Notice is taken that it is extremely well known that regularly updated data is stored in DRAM device. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include the use of DRAM for storing data to be transmitted.

Claims 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otani, in view of Eng, and Friedman, and further in view of Data-Over-Cable Service Interface Specifications (DOCSIS), Radio Frequency Interface Specification, SP-RFI-102-971008, Interim Specification, Cable Television Laboratories, 1997, hereafter referred to as DOCSIS-1997.

Regarding claims 30-31, Otani, in view of Eng, and Friedman, discloses a processor for controlling one or more pairs of MAC/PHY for transmission of the first and second type of traffic, as described in the response to claim 35.

Otani does not disclose prior to setting up the second upstream channel, requesting initial ranging using the first upstream channel;

if the transmission power level is not greater than the maximum transmission power level, adjusting the transmission power level of the cable modem when the headend fails to respond to the initial ranging request;

If the transmission power level is greater than the maximum transmission power level, setting up the cable modem with a next first upstream channel; and

Performing periodic ranging with the headend when the headend responds to the initial ranging request.

DOCSIS-1997 discloses a method and apparatus for initial and periodic ranging for a single channel cable modem, wherein:

Prior to setting up the second upstream channel, requesting initial ranging using the first upstream channel is described in page 95, section 7.2 Cable Modem Initialization;

If the transmission power level is not greater than the maximum transmission power level, adjusting the transmission power level of the cable modem when the headend fails to respond to the initial ranging request is shown in Figure 7-7 (Adjust local power, Wait for Station

Maintenance Opportunity) on page 103, and described in page 105, Section 7.2.5.1; bullet 1 and 2;

If the transmission power level is greater than the maximum transmission power level, setting up the cable modem with a next first upstream channel is described in page 98, section 7.2.3, and page 63, Section 6.3.2.2; and

Performing periodic ranging with the headend using the first upstream channel when the headend responds to the initial ranging request is described in page 105., section 7.2.5.2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include the initial and periodic ranging, as disclosed by DOCSIS-1997, to synchronize the timing information between the cable modem first channel and the headend for subsequent data transmission.

Regarding claims 32, 34, Otani, in view of Eng, and Friedman, discloses a processor for controlling one of more pairs of MAC/PHY for transmission of the first and second type of traffic, as described in the response to claim 35.

Otani does not disclose the cable modem is setup to transmit over the second upstream channel that differs from the altered first upstream channel value, when a value of the first upstream channel is altered by the periodic ranging.

DOCSIS-1997 discloses a method and apparatus for initial and periodic ranging for a single channel cable modem.

Since the processor controls both sets of MAC/PHY pairs, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani, in view of Eng, Friedman and DOCSIS-1997, to include the processor using the altered value of the first upstream channel as a prior knowledge for setting up the second upstream channel, in order to shorten the periodic ranging, and thus, improve response time to the user.

Regarding claim 33, Otani, in view of Eng, and Friedman, discloses a processor for controlling one or more pairs of MAC/PHY for transmission of the first and second type of traffic, as described in the response to claim 35.

Otani does not disclose:

After setting up the cable modem to transmit over the first upstream channel, requesting initial ranging using the second upstream channel;

If the transmission power level is not greater than the maximum transmission power level, adjusting the transmission power level of the cable modem when the headend fails to respond to the initial ranging request;

If the transmission power level is greater than the maximum transmission power level, setting up the cable modem with a next second upstream channel; and

Performing periodic ranging with the headend using the second upstream channel when the headend responds to the initial ranging request.

DOCSIS-1997 discloses a method and apparatus for initial and periodic ranging, as described in the response to claims 30-31.

Since the processor controls both sets of MAC/PHY pairs, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include the initial and periodic ranging, as disclosed by DOCSIS-1997, to synchronize the timing information between the cable modem second channel and the headend for subsequent data transmission.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otani, in view of DOCSIS-1997.

Otani does not disclose the "the setting up of the cable modem", as claimed.

DOCSIS-1997 discloses "the setting up of the cable modem", as described in page 98, Section 7.2.3 Obtain Upstream Parameters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Otani to include "the setting up of the cable modem", as disclosed by DOCSIS-97, to enable cable modem to obtain the first upstream channel for transmitting upstream data.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry)

Or:

(703) 308- 5399 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal
Drive, Arlington. VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner
should be directed to Vivek Srivastava whose telephone number is (703) 305 - 4038. The
examiner can normally be reached on Monday - Thursday from 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Andy Faile, can be reached at (703) 305 - 4380.

Any inquiry of a general nature or relating to the status of this application or proceeding
should be directed to the group receptionist whose telephone number is (703) 305 - 3900.

VS

3/8/03



VIVEK SRIVASTAVA
PATENT EXAMINER